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# NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

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## Quarterly Progress Report

March - May 1975

Investigation Title: Utilization of EREP Data in Geological Evaluation  
Regional Planning, Forest Management, and Water  
Management in North Carolina

EREP Investigation No.: G18

Contract No.: NAS9-13321

Principal Investigator: Charles W. Welby

Date: June 6, 1975

NASA Technical Monitor: Mr. James C. Derington  
Code FF 33  
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During the March - May quarter work began on the evaluation SKYLAB imagery  
compiling vegetational and land-use information in conjunction with a  
potential state park site in along the Eno River in Durham County. Ground-  
truth was available from past intense studies and from field observations.  
The final report is in preparation, but preliminary evaluation indicates  
that accuracy of identification was at the 90 percent level.

Potential geologic applications of SKYLAB imagery have been investigated  
during this quarter for southwestern North Carolina and adjacent to South Carolina.  
Comparisons of the imagery with published and unpublished geologic maps  
is being made. Attempts at distinguishing between rock types in the  
Piedmont have proved generally unsuccessful, and recognition of linear  
features seems the best geologic use which the imagery can be put. The  
study has been concentrated in the High Rock Lake area of Davidson County.

The study on use of SKYLAB imagery as a tool in environmental impact  
studies for the Raleigh-Durham airport has continued during the quarter.  
The land-use study has been completed and the existing environmental impact  
statement has to be studied and evaluated in terms of the interpretation  
made from the SKYLAB imagery. S190A and S190B as well as U-2 imagery  
have been used and compared. A total of 118 man-hours was spent in the

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(E75-10330) UTILIZATION OF EREP DATA IN  
GEOLOGICAL EVALUATION, REGIONAL PLANNING,  
FOREST MANAGEMENT, AND WATER MANAGEMENT I,  
NORTH CAROLINA Quarterly Progress Report,  
Mar. - May 1975 (North Carolina State Univ.) G3/43

study by relatively inexperienced interpreters. An area of 40 square miles was mapped using each of the three types of imagery and an experienced interpreter could probably map the area in much less time.

One nearly completed study evaluating SKYLAB photographs for land-use mapping in urban and rural areas of piedmont North Carolina shows that S190A and S190B as well as U-2 imagery have almost the same accuracy when the interpretations are assessed with the square grid sampling method, even though the S190B imagery basically has a greater resolution. For placing boundaries between land-use types, the color film proved more useful. Agricultural land-uses consistently appeared larger on the maps made from the color infrared film than they actually are as determined from groundtruth data.

Urban forestry studies have been utilizing 70 mm stereopairs on a B & L zoom 70 stereomicroscope, and 9" x 9" color transparencies on a B & L zoom transferscope (ZTS). The stereo-studies show good detail of urban land-use at 20x, but greenspaces of one city block square can be readily identified only with the help of ground studies on air photos.

The ZTS studies and mapping of 9" x 9" transparencies at 10x allow general urban land-use classification (e.g. industrial-commercial, highly-developed residential, wooded or lightly-used residential). At 6x forest, farmland and some ground-cover (conifers, woodleaved trees) differentiations can be made. At 2x urban boundaries are easy to identify.

The urban studies are continuing for further land-use identification, urban esthetics, and mapping scales.

A copy of the internal report on the study of vegetational types and crops in northeastern North Carolina is enclosed.

For the balance of the contract period (to October 31, 1975) studies presently underway will be completed and the final report will be prepared. Studies of the S192 data will also be completed. Contacts with state and regional planning agencies will be continued to encourage use of the SKYLAB data in their operational programs.

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